Tandy XENIX System V/286
Maintenance Upgrade Version 01.00.02
(Installation Notes)

This **Tandy XENIX System V/286** kit upgrades the **XENIX Version 01.00.00** or **Version 01.00.01** to **Version 01.00.02**. **Do not** use this upgrade if you **do not** have **Version 01.00.00** or **Version 01.00.01** currently installed. This document is provided to assist you with the installation.

Installap

The maintenance upgrade is provided on an *installap* diskette. To run the upgrade script, log onto the console as *root* (the super-user). Once logged in, type the following command:

```
# installap [ENTER]
```

The *installap* program displays its menu and following prompt:

```
Please Select :
```

Select the installation option by pressing [1]. The screen shows:

```
Insert diskette in Drive 0 and press <Return>
```

Introduction Menu

Place the maintenance upgrade diskette into Drive 0, close the door, and press [ENTER]. XENIX mounts the maintenance upgrade diskette onto */mnt* and runs the upgrade script */mnt/install*. The screen shows copyright information and a list of files that the program intends to alter. The screen shows the following prompt:

```
Press ENTER to continue, or enter Q to quit:
```

Press [ENTER] to continue installing the upgrade, or type Q[ENTER] to terminate this program. If you choose to terminate the program, XENIX returns you to the *installap* menu. Pressing [Q] terminates the *installap* utility.

An Overview of the Upgrade

The Maintenance Upgrade 01.00.02 is divided into two phases. The first phase involves updating printer utilities and the runcobol program. The changes composing the first phase were part of the Maintenance Upgrade, Version 01.00.01. The second phase involves updating the XENIX kernels, adding new capabilities to the keyboard utility, and providing an installable PC2 cartridge disk driver. If you have already installed Maintenance Upgrade Version 01.00.01, please turn to "Installing the PC2 Cartridge Disk Driver." If you have not already installed Maintenance Upgrade 01.00.01, continue with the directions in the following section.

Installing the Utility Files

After you press [ENTER], the upgrade begins. The screen shows that XENIX is installing the files: *lpinit, lprint*, and *runcobol*:

```
Installing utility updates.
        (copying /etc/lpinit)
        (copying /usr/bin/lprint)
        (copying /bin/runcobol)
```

The new *lpinit* file contains changes to correct a potential problem with maintaining System III printing compatibility. This change does not directly impact the functionality of the *lpinit* utility.

The new *lprint* file corrects a problem in which a super-user process, running the local print utility, erroneously changes the permissions of */dev/tty*, so that a normal user cannot access the device.

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The new COBOL runtime file, *runcobol*, contains a change to add a line feed character at the end of every line submitted to a printer, instead of a carriage return *and* a line feed. You may need to reset your printer's DIP switches to accommodate this change.

Altering the System III Printer Interface Files

After these changes have been added, the upgrade attempts to update the XENIX System III printer compatibility file, */usr/lib/sysIII*, and any files in the */usr/spool/lp/interface* directory which were based on (copied from) the file */usr/lib/sysIII*. If the file */usr/lib/sysIII* has not been altered since the initial Version 01.00.00 installation, the script will alter the appropriate files. The screen shows:

```
(altering /usr/lib/sysIII)
(altering /usr/spool/lp/interface/interface-filenames)
```

If the */usr/lib/sysIII* file has been modified, the upgrade displays the information concerning the nature of the alteration and instructs you to make the same type of alterations on both */usr/lib/sysIII* and any interface files that were based on that file. These files reside in the directory */usr/spool/lp/interface*.

Updating the Installable Printer Driver

The script next upgrades the installable line printer driver. The screen shows:

```
(copying /lib/sys/lp/lpidd.x)
```

This corrects a problem with the printer driver, which incorrectly enforces mutual exclusion. This correction is also included in the kernel updates, described later in this document. If you have already configured the line printer device driver into your installable device driver kernel, the file */lib/sys/lpidd.x* will also be updated.

Installing the PC2 Cartridge Disk Driver

The script then installs the cartridge disk driver, which supports the PC2 (short) adapter card. The screen shows:

```
The program will now install the new installable car-
tridge disk driver which supports only the IOMEGA
short card (also known as the PC2 card). The previous
version of the installable cartridge disk driver will
be preserved in the directory /lib/sys/cdpc0. The
previous version supports only the IOMEGA long card
(also known as the PC0 card).

        (preserving PC0 installable driver)
        (copying /lib/sys/cd/cdidd.x)
```

For further information on how to use the new cartridge disk driver, turn to "Using the PC2 DCS Adapter with XENIX."

Installing the IDD Kernel

As the script continues, it updates the installable device driver kernel, */lib/sys/xenix*. The screen shows:

```
        (copying /lib/sys/xenix)
```

This file corrects some problems with the Version 01.00.00 kernel. The first problem concerns the line printer driver. The driver incorrectly enforces mutual exclusion on each printer device. When there are simultaneous attempts to access the printer device, this problem causes the device to remain in an erroneous BUSY state.

The second problem resides in the multi-channel serial driver. Local print jobs are sometimes suspended on remote terminals connected to the multi-channel serial boards.

This 1.00.02 version of the XENIX kernel provides support for Tandy EGA monitors and adapters in text mode, and corrects problems with memory allocation in large model programs.

This upgrade corrects these problems in both the installable device driver kernel */lib/sys/xenix* and in the default kernel */xenix.*

Installing the Default Kernel

As the script continues, the screen shows:

```
Installing the default kernel update.
        Do you wish to copy the existing kernel file
        before installing the new /xenix?  (y/n):
```

The provided default kernel has the same configuration as the Version 01.00.00 default kernel, */xenix.* This configuration provides device driver support for the following add-on devices:

- One disk cartridge adapter

- The primary serial/parallel adapter

- Two multi-channel serial adapters

- One tape cartridge adapter

If you have altered the Version 01.00.00 default kernel so that it no longer reflects this configuration, you may wish to save it before installing the upgrade kernel. Please note that if you have performed any alterations to the Version 01.00.00 default kernel, such as changing the swap size or adding device drivers, you should perform these same alterations to the upgrade kernel. Until the upgrade kernel is configured in the same way as the kernel you are currently running on, do not boot under the upgrade kernel. If you wish to save your old kernel, type Y [ENTER] at this prompt. Otherwise, type N [ENTER].

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If you decide to save /xenix, the program will save /xenix into another file. The program prompts for the name of the new file:

```
Enter file name to copy existing /xenix to:
```

Choose a filename that does not currently exist on the file system. You may specify a full pathname if you wish. Type the filename and press [ENTER]. The screen shows:

```
(saving /xenix as filename)
```

The script continues by copying the new default kernel to /xenix. The screen shows:

```
(copying /xenix)
```

Although this new kernel is installed as /xenix, you are still running under the old kernel. To run under the new kernel, you must shut down your system and re-boot with the new /xenix after this upgrade program is complete. If you shut down your system, be sure that all other users are logged off. Refer to the section titled "Using the haltsys Command" in the *XENIX Operations Guide* for instructions on how to shut your system down.

Updating the Keyboard Utility

The script then updates the keyboard utility, which provides international keyboard support. The screen shows:

```
Updating /bin/keyboard
```

For more information about the updated keyboard utility, see the **keyboard** (C) manual pages included in this documentation.

Adding the Logbook Entry

The script concludes by adding an entry to your system's logbook, */etc/logbook*. The screen displays:

```
Updating /etc/logbook
        (altering /etc/logbook)
```

When this is complete, the upgrade script terminates and returns to the *installap* menu. To terminate the *installap* program, type Q[ENTER].

DMP-2200 Local Print Problem

Local printing to a *Tandy DMP–2200* connected to a *Tandy DT–100* terminal running at 9600 baud can randomly print an extra character at the beginning of some lines. To avoid this problem when using this configuration, set the terminal at a speed of 4800 baud or less during the local printing session.

How to Implement System III Printer Compatibility in a System V Environment
(Print Spooling vs. Lock Semaphores)

XENIX System III and XENIX System V use different methods to keep printer output from interleaving. Printer applications that are designed to run under System III environments can cause printer applications that are designed to run under System V environments to behave unpredictably, and vice versa.

System III provides a method of using lockfiles as semaphores. If a printer application wishes to print, it produces a file named */usr/spool/lpd/lock* and then accesses the printer device. When printing is finished, the printer application removes this lockfile. If a lockfile already exists, however, another printer application has established the lockfile and is using the printer. The requesting printer application must wait until the active printer application is finished and the associated lockfile is removed. When an application *owns* the printer

device it can either submit its output to the printer via the *lpr* utility or write directly to the printer raw device, */dev/lp*.

System V provides a print spooler, */usr/lib/lpsched*, to control the access of the printer device for requesting printer applications. When the spooler allows a job to print, the spooler filters the job through the interface program of the intended *printer name*, which then forwards it to the corresponding *printer device*. The printer applications must submit their jobs via the *lpr* utility or shut down the scheduler to write to the raw printer device. This method makes writing to the raw printer device impractical.

The System V method of printing has been augmented so that spooled jobs honor the System III lockfile method. This was accomplished by providing front–end interface programs that check for and implement a lock semaphore mechanism, invoke the *real* interface program, and release the lock semaphore.

The lock semaphore mechanism must employ two files in the directory */usr/spool/lp/interface*. The first file is the interface program created by the *lpinit* or *lpadmin*. This interface program can be a copy of any model interface program found in the directory */usr/spool/lp/model*, an interface program provided by a printer application, or an interface program that you have written. The second file is a copy of the file */usr/lib/sysIII*. The first file will be named */usr/spool/lp/interface/_*printername, and it is invoked by the second file, */usr/spool/lp/interface/*printername.

For example, if you use the *lpinit* utility to create a printer called *myprinter*, *lpinit* creates an interface file called */usr/spool/lp/interface/myprinter*. This file is the *real* interface program. To implement the lock semaphore mechanism correctly, you must rename this interface file to */usr/spool/lp/interface/_myprinter* and copy the front–end interface program, */usr/lib/sysIII*, to */usr/spool/lp/interface/myprinter*. Change the owner, group, and permissions of the front–end interface file to be the same as the *real* interface program. (Refer to *chown(C), chgrp(C),* and *chmod(C)* in the *XENIX Command Reference Volume I* for the usage of these commands.)

This procedure ensures that spooled requests follow the rules of lock semaphores used by System III print applications.

To ensure the integrity of both System III and System V printer applications, it is strongly recommended that all System V *printer names* use the lock semaphore mechanism when using their interface programs. Any printer which has been specified as the default printer by the *lpinit* utility automatically uses this mechanism.

Using the PC2 DCS Adapter with XENIX

Hardware Requirements

To use the PC2 (short) Adapter board with XENIX-286, you must set the option switches on the adapter board to these positions:

ON

PORT: 340-345H

1 2 3 4 5 6 7 8
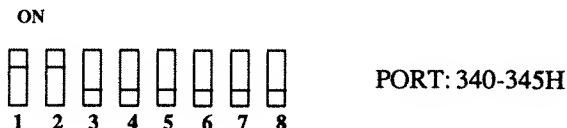
(On some switches, the up position is labeled as "ON" or "CLOSED".)

The RAM/ROM jumpers must be set as follows:

1   2   3   4

ROM: D000:0000
RAM: D000:1800

Refer to the installation instructions you received with the adapter board if you have any problems locating the switches or jumpers.

The Cartridge Disk driver (cd) that is supplied with the early releases of XENIX will not function with the PC2 adapter card. Included in this release is an installable device driver which will function with this particular adapter card. You *must* use an idd kernel containing the new **cd** driver in order to use the PC2 adapter.

When XENIX boots, it displays the version codes for the various hardware drivers it contains. If the version for the **cd** driver starts with a **1**, like 1 (11) 8-Jun-86, then this version will not communicate with the PC2 adapter card. To reduce confusion, all the new versions of this driver state what adapter they are for and what types of drives they will work with. For example, the installable driver included in this release displays PC2 A10/A20. This means the driver is meant to be used with the PC2 adapter card and either a 10 or 20 megabyte eight-inch drive.

Creating an IDD Kernel with the PC2 Cartridge Disk Driver

If you have installed a short PC2 cartridge disk adapter card in your Tandy 3000, complete the following instructions so that XENIX will be able to communicate with the cartridge disk device. You will create a customized kernel that will contain the drivers for each device on your system using the *installidd* command.

Study the following device list and make note of the devices installed in your system.

cd	Cartridge Disk Drive, short PC2 adapter card
lp	Parallel Printer port(s)
sio	Standard Single Serial Port Adapter(s)
mt	Magnetic Streaming Tape Drive
cdpc0	Cartridge Disk Drive, long PC0 adapter card

For each device in the list that is installed in your system, you will run the *installidd* utility. Read the documentation on *installidd* in the (M) section of the manual before running the command. After reading the documentation, continue with these instructions.

First, you will need to install the cartridge disk driver which supports the PC2 adapter card (if you plan to have the card installed on your system). Enter the following commands:

```
cd /lib/sys [ENTER]
installidd -d cd [ENTER]
```

This command installs the driver which supports the PC2 cartridge disk adapter card.

Next, run *installidd* for all other devices installed in your system which are included in the list above. For example, if you have a standard single serial port adapter (sio) installed, run the command:

```
installidd -d sio [ENTER]
```

Continue running *installidd* for each device included in the list above which you have installed in your computer system.

If your computer system has the long PC0 adapter card and you wish to install the PC0 cartridge disk driver **instead of** the PC2 cartridge disk driver, enter the command:

```
installidd -d cdpc0 [ENTER]
```

You can install either the PC2 cartridge disk driver or the PC0 cartridge disk driver, but not both. Note also that the standard kernel, */xenix*, includes the PC0 cartridge disk driver. You must follow the instructions above to install the PC2 cartridge disk driver.

After running *installidd* for all devices, type the following commands:

```
sync; /etc/haltsys [ENTER]
```

which will shut down XENIX. Press [ENTER] to reboot, and when the SYSV XENIX BOOT prompt appears, type the command:

```
cf [ENTER]
```

This command causes the boot program to link the drivers you have just installed together into a new kernel. Soon, the new XENIX kernel will reboot, and you should type [CTRL] [D] as usual to go into multiuser mode. XENIX will then move the last kernel */xenix* to */xenix-* and configure the new kernel in */xenix*. Now, the PC2 driver has been installed in your kernel, and you should be able to use the cartridge disk device.

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Name

keyboard – Activates international console keyboards.

Syntax

keyboard *type* [*filename*]

Description

The *keyboard* utility lets you choose the character set for XENIX to use with the console keyboard. You may choose any of the following as the *type* :

FR	France Keyboard
GR	Germany Keyboard
IT	Italy Keyboard
SP	Spain Keyboard
UK	United Kingdom Keyboard
US	United States Keyboard
SW	Sweden Keyboard
DN	Denmark Keyboard
FN	Finland Keyboard
NW	Norway Keyboard
SR	Roman–Swiss Keyboard
SG	Germano–Swiss Keyboard
PR	Portugal Keyboard

The US keyboard table is resident when XENIX boots off of the installation floppy, and subsequently altered to the keyboard style chosen during the XENIX hard disk initialization.

If you want a different keyboard table to be resident when any kernel boots, specify the name of the kernel as the *filename*. For example, to install the Spanish keyboard permanently in the XENIX kernel */xenix*, type:

keyboard SP /xenix

To activate a keyboard only temporarily in the actively running kernel, type:

keyboard *XX*

where *XX* is the two letter abbreviation for the desired country as described above.

XENIX treats characters that appear on an international (non-US) keyboard and also appear on a US keyboard exactly as if they had been typed on a US keyboard. This happens even if the position of the key is different. However, XENIX sets the 8th bit on characters that do not appear on US keyboards but do appear on international keyboards (for example, the n-tilde on the Spanish keyboard). XENIX assumes, in most cases, that characters are 7 bits and does not handle these "high-bit" characters properly. For example, n-tilde and other high-bit characters cannot

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be used as a character in a filename and may cause unexpected behavior in other cases. For this reason, high-bit characters should be avoided if at all possible.

However, high-bit characters can be put into a file just like normal ASCII characters. To use the high-bit characters, you must enter the following command:

    stty -istrip cs8

Normally, XENIX strips the high bit from incoming characters because it expects 7 bit characters. If you plan to use the high-bit characters regularly, you should put the *stty -istrip* command in your *.profile* file (if you use /bin/sh as your shell) or in your *.login* file (if you use /bin/csh as your shell). Unfortunately, the text editors always strip input characters to 7 bits or refuse to work when a file contains high-bit characters. To place high-bit characters in a file, use the **cat** utility.

Dead Key Processing

There are certain keys on the French, German, and Spanish keyboards that do not produce a keystroke when pressed alone. These keys are called "dead keys". The German keyboard uses the key with ' and ` as a dead key, the French keyboard uses the key with ˆ and the diaeresis, and the Spanish keyboard has two dead keys: one with ' and diaeresis on it and the other with ` and ˆ on it. There are also dead keys on the Swedish, Danish, Finnish, Norwegian, Roman–Swiss, Germano–Swiss, and Portuguese keyboards.

When a dead key is pressed alone, a keystroke is not registered until another key is pressed. If the next key pressed can be legally combined with the dead key, the combination is registered as a single character and put in the keyboard queue. For example, if the ˆ key is pressed on the French keyboard and followed by pressing the 'a' key, a single character is put in the keyboard queue whose ASCII code is hexadecimal 83 (a high-bit character). This is echoed on the screen as an 'a' with a circumflex on top (if *–istrip* was set as described above).

If the next key pressed cannot be legally combined with the dead key, the two characters that represent the dead key and the following key are both put in the keyboard queue. For example, if the ˆ key is pressed on the French keyboard and followed by pressing the 'x' key, two characters are put in the keyboard queue, namely, the ˆ character and the 'x' character. If a dead key is followed by a space, only the dead key is put in the keyboard queue. For example, if the ˆ key is pressed on the French keyboard and followed by pressing the space bar, only the ˆ character is put in the keyboard queue.

The following table describes the dead keys that are available on the various international keyboards.

Keyboard	Dead Key	Second Key	Result
France	^	a e i o u	â ê î ô û
	¨	a e i o u y A O U	ä ë ï ö ü ÿ Ä Ö Ü
Germany	´	a e i o u E	á é í ó ú É
	`	a e i o u	à è ì ò ù
Spain Sweden	´	a e i o u E	á é í ó ú É
Finland Norway	`	a e i o u	à è ì ò ù
Denmark Roman-Swiss	^	a e i o u	â ê î ô û
Germano-Swiss	¨	a e i o u y A O U	ä ë ï ö ü ÿ Ä Ö Ü
Portugal	´	a e i o u A E I O U	á é í ó ú Á É Í Ó Ú
	`	a e i o u A E I O U	à è ì ò ù À È Ì Ò Ù
	^	a e o A E O	â ê ô Â Ê Ô
	~	a o n u A O N U	ã õ ñ ü Ã Õ Ñ Ü

Displaced Keys

All keys that are present on the US keyboard are present on all international keyboards. To make room for the high-bit international characters, some keys had to be displaced. On most international keyboards, the left bracket ([) and right bracket (]) keys are used for new characters in the foreign alphabet of other countries. For instance, on the French keyboard, press the dollar sign key ($) (located in the same place as the right bracket key on the US keyboard) while the CTRL and ALT keys are pressed simultaneously. The dollar sign key on the French keyboard has the right bracket (]) printed on the front face of the key. This indicates that CTRL-ALT- dollar sign produces a right bracket character. The same is true for all keys with a character printed on the front face of the key. In order to read the character from the keyboard, press the key while holding down both the CTRL and ALT keys.

Notes

Stand-alone programs such as **boot** and **badtrack** use the US keyboard table.

The "section" key (which shares the '6' key on the French keyboard and the '3' key on the German keyboard) cannot be printed properly in XENIX because its ASCII value is the same as CTRL-U.

The Sweden and Finland keyboards are identical.

During the initialization of XENIX, the *keyboard* utility is run so that international installations can be easily accomplished. During this procedure, all pre–released kernels are activated to use the keyboard style chosen during the XENIX initial initialization. These kernels include: the active kernel during installation, (*/dev/kmem*), the hard disk kernel being installed (*/xenix*), and the loadable device driver kernel (*/lib/sys/xenix*). This fact implies that this utility need not be manually invoked unless a new kernel is created, using the Software Development Package, or if a different style of keyboard is connected.